The Relationship between Polychlorinated Biphenyls (PCBs), VPDES Wastewater/Stormwater Facilities, Stormwater Industrial General Permitted Facilities (ISWGPs), and the Standard Industrial Classification System (SIC)

Virginia Department of Environmental Quality (VDEQ)
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Background

Polychlorinated Biphenyls (PCBs) were manufactured by Monsanto Company under the Aroclor trade name from 1929 through 1977 when production was discontinued. By 1979 the Environmental Protection Agency (EPA) banned the manufacture and import of PCBs to the U.S (ATSDR, 2000). PCBs have since been phased out of service under regulation from the Toxics Substances Control Act (TSCA). However, after three and a half decades since the ban, PCBs remain remarkably prevalent in the environment. This is due in large part to their synthetic organochlorine makeup, which makes them extremely persistent in the environment. Of note, there are a total of 209 individual PCB congeners (i.e., isomers) with varying levels of chlorination. Aroclors were derived as mixtures of the different congeners until a specified level of chlorination was attained which depended on the intended use of the product. Along with persistence due to their chlorination, PCBs have remained relevant based on their lipophilicity, which creates a strong propensity to accumulate in living organisms with subsequent food chain biomagnification (New York Academy of Sciences, 2005).

Releases of PCBs

PCBs have historically been released to the environment, both accidentally and intentionally. They are transported into the atmosphere and water, and onto land through smokestacks, spills, sewers, stormwater runoff, and direct applications (e.g., dust suppression; ODEQ, 2012). As time passed, their continued release to the environment was thought to have diminished as they were no longer detected in matrices other than soil, sediment, and tissue, which serve as reservoirs of this strongly hydrophobic contaminant. As such, the prevailing thought of PCB sources continue to be one of "legacy" issues such as those originating from outdated or illegal landfills, metal scrap yards, and leaks of electrical equipment (ODEC, 2012).

More recently a "new" or contemporary category of PCB contamination has surfaced where the origin is consistent with certain manufacturing processes. Recent studies (Hu et al., 2010; Rodenberg et al., 2010; Washington State Dept. of Ecology, 2014) have documented that PCBs are present in packaging materials etc. and products (i.e., paint pigments) can contain PCBs inadvertently derived from specific industrial processes. The inadvertent production of PCBs is recognized as "allowable" under TSCA for some manufacturing processes at concentrations up to an annual maximum of 50 ppm (40CFR part 761.3; EPA 1982). Furthermore, current regulations under TSCA consider transformer dielectric fluids < 50 ppm to be defined as "non-PCB" (40CFR part 761.3, Subpart A.). This equates to the legal use of transformers that contain dielectric fluids at concentrations up to 49.9 ppm, or eight orders of magnitude higher than Virginia's Water Quality Criterion for total PCBs (tPCB) (WQC; 0.00000064 ppm or 0.00064 µg/L; VDEQ 2010, 9VAC25-260).

PCB TMDL Development

Virginia has over 1,000 miles of rivers and greater than 2,000 estuarine square miles listed as impaired for PCB fish consumption advisories. To address this issue on a watershed scale, the Virginia Department of Environmental Quality (VDEQ) uses Total Maximum Daily Load (TMDL) studies (Haywood, H. C. and C. Buchanan. 2007; Tetra Tech, Inc. 2009). TMDLs are designed to either meet an instream tPCB WQC of 640 pg/L (parts per quadrillion or 0.00064 µg/L) or a site specific endpoint if applicable, to reduce or minimize PCB bioaccumulation for eventual restoration of the fish consumption use.

In Virginia, the use of low level EPA method 1668 (U.S. EPA, 1999) which has detection limits of < 10 pg/L on a congener basis, has proven to be instrumental in the source investigation component of TMDL development. For example, relatively small aliquots (2L) of ambient water can be collected, analyzed by the low level method, and used to determine relative concentrations from prospective sources as well as for direct comparisons against the WQC. Similarly, Virginia Pollutant Discharge Elimination System (VPDES) Program effluent samples can be analyzed and evaluated following the identical approach. From this information, relatively accurate loading estimations can be derived from the tPCB data. Conversely, EPA compliance methods 608 or 8082, which target PCB Aroclors, have detection levels of 0.065 µg/L & 0.54-0.9 µg/L, respectively, which are well above Virginia's WQC (0.00064 µg/L) to protect the fish consumption use. An additional and significant advantage to method 1668 is that it targets all PCB congeners, whereas methods 608 and 8082 only consider congeners contained in the laboratory analytical standard from the original Monsanto Aroclor mixtures. Without the inclusion of all 209 PCB congeners, environmentally weathered Aroclors can be grossly underestimated. For these reasons, PCB data generated using method 1668 is crucial to source identification for developing viable TMDLs where sufficient reductions are set. The TMDL effort will hopefully lead to the eventual reinstatement of the "fishable" use after TMDL implementation.

The TMDL process is initiated with a study designed to identify instream concentrations, as well as conveyances from a myriad of prospective PCB sources that contribute to fish impairments. One of several categories targeted in the source investigation study, and the focus of this evaluation, includes point source discharges regulated under the VPDES Program. Effluent data requested for TMDL development is generated in accordance with TMDL Guidance Memo No. 09-2001, Amendment No. 1 (DEQ 2009), otherwise known as Virginia's "PCB Point Source Monitoring Guidance".

Study Objective

The primary objective of this evaluation is to present a broad view of "current" PCB data derived from a wide mix of industrial waste streams identified under different Standard Industrial Classifications (SIC) as well as municipal wastewaters. A secondary objective is to provide supporting information showing the need to further screen, through low level monitoring, the applicable SICs that discharge to waterbodies in Virginia identified as PCB impaired. It is important to note, however, that it is not the intent of this evaluation to identify those SIC codes that should be monitored as part of PCB TMDL development, only those that may be considered.

Method

The Virginia Department of Environmental Quality's (DEQ) "PCB Point Source Monitoring Guidance" (TMDL GM No. 09-2001; DEQ 2009) has been utilized to provide guidelines in determining which facilities should be monitored for PCBs within impaired waters due to fish consumption advisories for PCBs. Specifically, the guidance document outlines types of permitted facilities that should be considered and have been monitored for tPCB based on their Standard Industrial Classification (SIC, Table 1; SIC is defined in TMDL GM No. 09-2001). In some instances, as supported by the aforementioned guidance, professional judgment was employed using historic site activity as a basis for requesting tPCB data. The result was an expansion of some industries within Major SIC Groups beyond those specified in the guidance document (Table 2). The guidance also establishes Data Quality Objectives (DQOs) for generating low level PCB data that includes standardized sampling approaches employing clean techniques as well as using PCB analytical method 1668 (US EPA, 1999), as modified with the Delaware River Basin Commission (DRBC) protocol (DRBC, 1998). Total PCB data represented in this evaluation were collected from 2009 through 2014.

Table 1. Facilities identified as most probable sources of PCBs by SIC code (TMDL GM NO. 09-2001).

[a] SIC Code	Code Name Facility	SIC Code	Code Name Facility
26 & 27	Paper and Allied Products	5093	Scrap recycling
30	Rubber and Misc. Plastics	1221 & 1222	Bituminous Coal
33	Primary Metal Industries	3612	Transformers
34	Fabricated Metal Products	3731 & 3732	Ship/Boat Building/Repair
37	Transportation Equipment	4011	Railroads, Line Haul Ops
49	Electrical, Gas and Sanitary Services	5015	Motor Vehicle Pars, Used

[a] The two digit code represents the Major Group code of the Standard Industrial classification.

The analytical method measures PCBs at the part per quadrillion level (pg/L) on a congener basis. VPDES permitted facilities in Virginia asked to monitor for PCBs are to submit results to DEQ in an Electronic Data Digital (EDD) format for eventual upload to a Microsoft Access database. Prior to derivation of a tPCB concentration used in TMDL development, data are reviewed and corrected for background PCBs (TMDL GM No. 14-2004, DEQ 2014). However, since the current analysis is a broad scale evaluation, tPCB results have not been corrected unless specified. To provide some perspective, the bulk of the statewide effluent data shows that the impact of background PCB concentrations diminishes significantly as tPCB concentrations increase when comparing uncorrected (uncensored) vs. corrected (censored) data. The following are examples of the resulting mean and median percent changes ($\leq$ 640 pg/L (WQC), $\bar{x}$= -62.3%, median -72%; > 1,000 pg/L, $\bar{x}$= -12.9%, median-3%) from original (uncensored) concentrations. Original concentrations above 2,000 pg/L are affected even less ($\bar{x}$ = -3.39%, median -0.55%) by correction procedures using background concentrations.

Table 2. Applicable Major SIC Code Groups representing VPDES facilities in Virginia that have had effluents screened for tPCBs using EPA Method 1668. **Boldfaced = New Group not included in original TMDL GM No. 09-2001 but to be considered for future monitoring based on PCB screening results.** Note: Select industries within each SIC Code Group were screened for tPCBs (Attachment 1).

Major SIC Code Group	SIC Code Description
2000	**Food & Kindred Products MFRS**
2100	**Tobacco Products MFRS**
2200	**Textile Mill Products MFRS**
2600	Paper & Allied Products MFRS
2700	Printing Publishing & Allied Industries
2800	**Chemicals & Allied Products MFRS**
3000	Rubber & Miscellaneous Plastics MFRS
3200	**Stone Clay Glass & Concrete Products MFRS**
3300	Primary Metal Industries MFRS
3400	Fabricated Metal Products MFRS
3600	Electronic & Other Electrical Equipment MFRS
3700	Transportation Equipment MFRS
4000	Railroad Transportation
4200	**Motor Freight Transportation/Warehouse**
4400	**Water Transportation**
4700	**Transportation Services**
4900	Electric Gas & Sanitary Services
5000	Wholesale Trade-Durable Goods
5100	**Wholesale Trade-Nondurable goods**
7600	**Miscellaneous Repair Service**
9700	**National Security and International Affairs**

Results

Total PCB results are presented below from specific facilities that were selected for screening using the "PCB Point Source Monitoring Guidance" (TMDL GM No. 09-2001; DEQ 2009). For applicable dischargers, professional judgment was also used based on anecdotal site specific information. Basic statistics for tPCB data are summarized by Major SIC Group Code in Table 3, although it is important to note that only select industries are considered within each Major SIC Group Code. Detailed results for industries within each Major SIC Group Code can be found in Attachment 1. When compared to the entire data set, there are several SIC Group Codes that contain abnormally high mean concentrations of PCBs (i.e., > 25X the WQC). These include: 2200 (Textile Mill Products), 2800 (Chemical and Allied Products), 3300 (Primary Metals Industries), 3600 (Electronic and Other Electrical Manufacturers), 4400 (Water Transportation), 4700 (Transportation Services), 4900 (Electric, Gas and Sanitary Services), and 5000 (Wholesale Trade-Durable Goods). Conversely, SIC Group Codes 3000 (Rubber and Miscellaneous Plastics MFRS) and 3200 (Stone Clay Glass and Concrete Products MFRS) have shown relatively low concentrations that approximate the WQC.

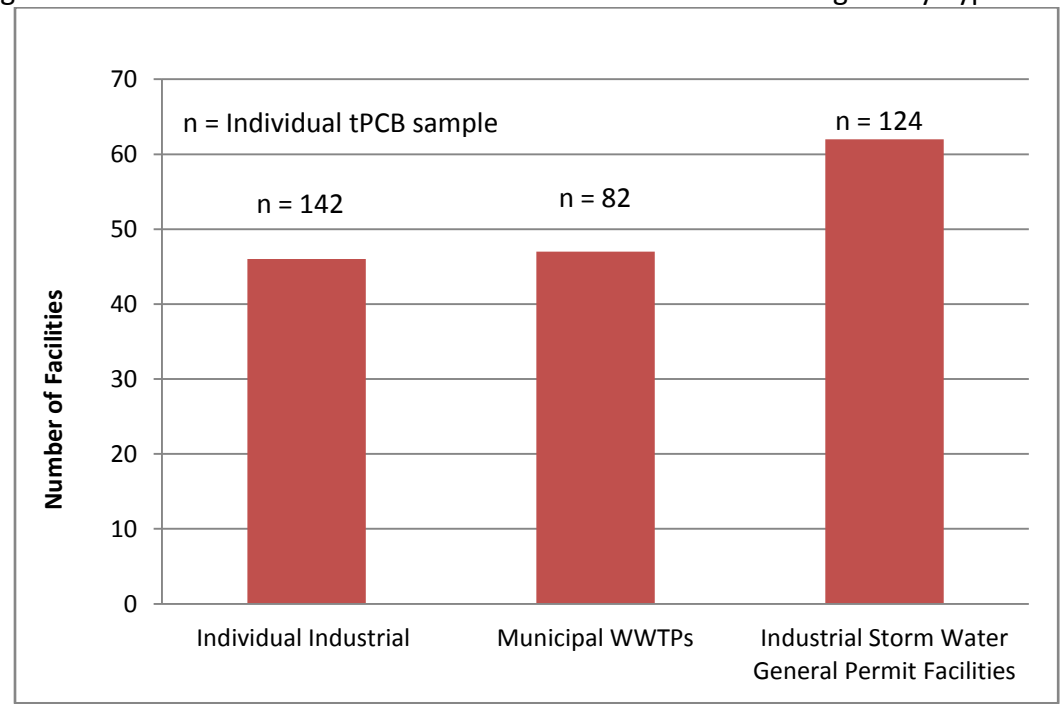
Table 3. tPCB (pg/L) summary statistics for different industrial classifications (SICs) within each Major SIC Code Group. The count (n) represents facility specific SICs and/or distinct outfalls within the SIC Code Group. **Boldfaced = Includes results from Major SIC Code Groups not listed in original TMDL GM No. 09-2001 but to be considered for future monitoring**.

SIC Code Description	Major SIC Code Group	Mean	Median	Min	Max	StDev	CV	n (samples)
Food & Kindred Products MFRS	2000	12,094	12,094	435	23,754	16,489	136%	2
Tobacco Products MFRS	2100	1,713	1,713	107	3,319	2,271	133%	2
Textile Mill Products MFRS	2200	572,129	560,411	4,561	1,163,135	482,867	84%	4
Paper & Allied Products MFRS	2600	2,603	1,496	42	9,696	3,075	118%	11
Printing Publishing & Allied Industries	2700	2,562	2,509	920	4,309	1,782	70%	4
Chemicals & Allied Products MFRS	2800	16,661	2,333	360	219,158	47,548	285%	22
Rubber & Miscellaneous Plastics MFRS	3000	535	192	16	1,740	816	152%	4
Stone Clay Glass & Concrete Products MFRS	3200	915	915	915	915	n/a	n/a	1
Primary Metal Industries MFRS	3300	59,135	3,539	293	549,818	141,340	239%	15
Fabricated Metal Products MFRS	3400	7,110	1,584	258	32,455	9,256	130%	30
Electronic & Other Electrical Equipment MFRS	3600	65,118	47,347	1,357	171,603	67,502	104%	7
Transportation Equipment MFRS	3700	6,446	3,895	113	25,163	7,976	124%	26
Railroad Transportation	4000	4,250	3,063	1,986	7,700	3,036	71%	3
Motor Freight Transportation/Warehouse	4200	10,468	3,408	328	31,236	12,455	119%	9
Water Transportation	4400	72,591	8,585	960	398,805	159,885	220%	6
Transportation Services	4700	86,398	18,001	3,867	237,325	130,898	152%	3
Electric Gas & Sanitary Services	4900	18,106	1,111	9	683,039	84,474	467%	104
Wholesale Trade-Durable Goods	5000	648,236	56,432	154	7,477,679	1,515,454	234%	28
Wholesale Trade-Nondurable goods	5100	1,203	822	330	3,178	1,095	91%	6
Miscellaneous Repair Service	7600	6,556	6,556	6,556	6,556	n/a	n/a	1
National Security and International Affairs	9700	11,922	8,326	3,648	34,045	11,052	93%	6

Of particular note, the SIC 5000 (Wholesale Trade-Durable Goods) group contains Scrap Metal operations (SIC 5093) which frequently release tPCBs in effluent at concentrations in the µg/L (ppb) range. Data presented in Attachment 1 provides greater specificity within the broader Major SIC Group Codes and the associated relationship with tPCBs. Note that group 4911 (Electrical Services) has been split into 2 categories based on the age of the facilities (i.e., when the facility became commercially operational). The split includes power generation facilities constructed before 1985 and constructed post-1985. The Electrical Services data were split this way because there is an obvious demarcation in PCB concentrations observed depending on when facilities were constructed. For Electrical Services facilities constructed pre-1985, mean tPCB results were 51,011 pg/L ($\text{median} = 2{,}461$ pg/L) while mean tPCB results post-1985 were 286.6 pg/L (median = 125.4 pg/L).

Virginia VPDES facilities that have screened their effluents can also be placed into one of three categories irrespective of which Major SIC Group Code they represent. The facilities were grouped by permit type: individual industrial permits, municipal wastewater treatment plants (WWTPs), and industrial stormwater facilities regulated under a General Permit. Figure 1 includes a numeric count of facilities (plus number of samples analyzed). Mean tPCB concentrations for the three categories are 25,479 pg/L (median = 1,720.2 pg/L), 1,712 pg/L (median = 995.0) and 174,283 pg/L (median = 3,051.1 pg/L), respectively.

Figure 1. Number of Permitted Facilities Screened for tPCBs in Virginia by Type.



Results from the sanitary services portion of Major SIC Group Code group 4900 (i.e., Municipal WWTPs), originally lumped with Electric, Gas and Sanitary Services in Table 3, have been isolated and are presented in Table 4. The average tPCB concentrations for Municipal WWTPs effluents (Mean Conc. = 1,712 pg/L) are at relatively lower levels of PCBs although this can vary between facilities as shown by the Coefficient of Variation (CV) of 152%. While concentrations are not as high as some industrial facilities, these WWTPs may provide more significant PCB loading as they discharge continuously. An independent analysis would be necessary to account for the observed differences in concentrations between the Dry weather and Wet weather results.

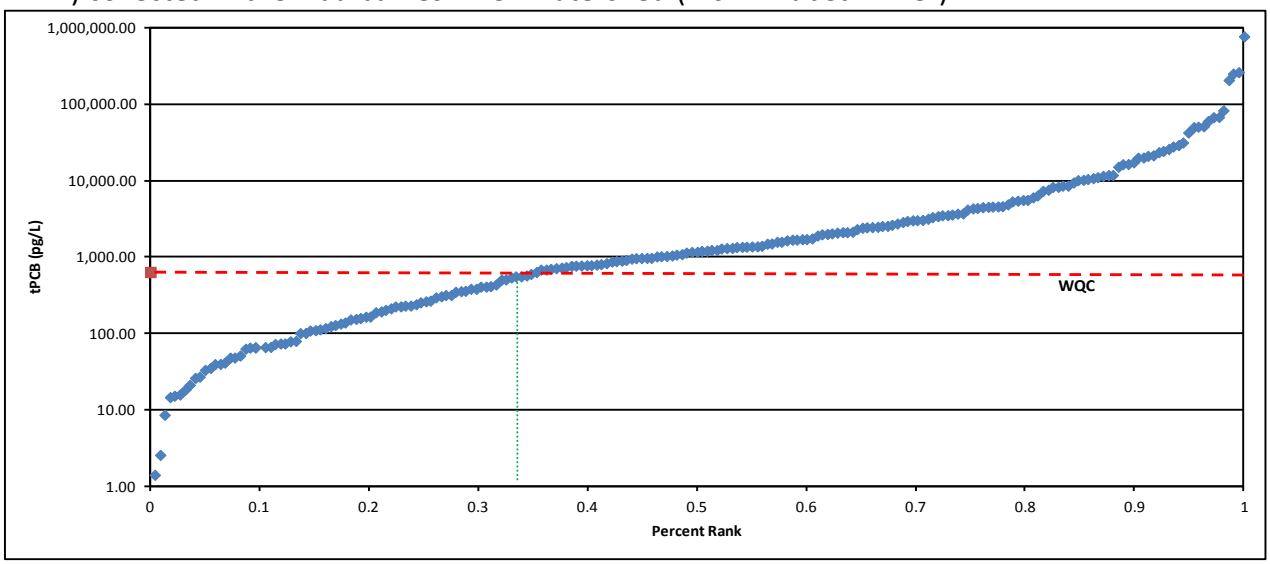
Table 4. tPCB (pg/L) summary statistics for Municipal WWTPs.

Statistic	tPCB Dry Weather (pg/L)	tPCB Wet Weather (pg/L)
n (samples)	45	37
Mean	1,953	1,445
Min	265	143
Max	17,891	7,588
StDev	2,973.9	1,501.7
CV	152%	104%

Note: The sample count varies between dry and wet weather conditions due to variances in permit requirements at different municipal facilities.

PCB data presented in Figure 2 illustrate a direct comparison of percent ranked data with DEQ's WQC. The effluent results in this evaluation include all available data generated for the tidal James River and Elizabeth River PCB TMDL study. This data subset, which comprises 64% of statewide effluent results, was selected because these individual data points have been corrected for background contamination using TMDL GM No. 14-2009 (DEQ, 2014). Accordingly, the resulting comparison between effluent concentrations and the criterion is more appropriate. The ranking also allows for an estimation of the percentage of the data set (65%) that exceeds the WQC. At this time it is unknown how this translates to a PCB load as the tidal James River and Elizabeth River TMDLs are still under development.

Figure 2. Percent Rank of Blank Corrected tPCB Concentrations (pg/L) from Effluent Samples (n = 222) collected in the Tidal James River Watershed (Incl. Elizabeth River).



Discussion

Total PCB data generated in Virginia under the auspices of "Virginia's PCB Point Source Monitoring Guidance" (TMDL GM No. 09-2001, DEQ 2009) indicate there are on-going PCB contributions from point sources at environmentally relevant concentrations. This finding is further reinforced by the robust state-wide dataset. It is important to note, however, that the mere presence of PCBs does not always translate to the conclusion of excessive loading. Furthermore, by using an extremely sensitive analytical method there is a high probability that PCBs will be present in most, if not all, environmental samples. However, there is a significant distinction between background concentrations and those observed from the many point sources. For example, uncensored background tPCB water data collected in non-impaired waterbodies within Virginia are typically at concentrations below 100 pg/L (DEQ, 2014). While not conclusively studied, the source of background PCBs in aquatic systems is likely attributed to atmospheric deposition (Fikslin and Suk, 2003; Haywood and Buchanan, 2007).

A broad analysis of PCB point source results reveal much higher concentrations attributed to specific industrial activities, with some Major SIC Code Groups (Wholesale Trade-Durable Goods-5000) containing industries (Scrap and Waste Materials - 5093) yielding tPCB results which are magnitudes higher than others. While some SIC Groups (Motor Freight/Transportation - 4200) have tPCB concentrations that are consistently elevated,

concentrations within other groups (Electric, Gas & Sanitary Services - 4900) can vary significantly. This may be due to factors such as age of the facility, type of sample collected (wet vs. dry), how the sample was collected, or intensity of the storm event sampled (wet samples). Conversely, there are also SICs (e.g., Unsupported Plastic Film and Sheet - 3081) where the facilities screened have not resulted in a preponderance of elevated PCBs. Although it is noteworthy the sample size is small ($\leq$ 2), it would be premature to draw conclusions at this time.

Another interesting aspect of this evaluation is the difference in the relative releases of tPCBs from individual permitted industrial, municipal facilities and general permitted industrial stormwater facilities. Point sources assigned Waste Load Allocations (WLAs) in PCB TMDLs often include large Municipal WWTPs as well as large industrial facilities. On the other hand, smaller stormwater industrial facilities with a general permit are typically not included within TMDLs. Rationale for excluding this facility type is due to a predicted de minimis PCB load given that the flow is not continuous. However, PCB data included in this evaluation for Industrial Storm Water GPs indicate that concentrations can be extremely elevated ($\bar{x}$ = 174,283 pg/L). These facilities could be significant contributors of PCB contamination in large waterbodies when considered collectively, or individually if located on small waterbodies.

A significant part of developing the "PCB Point Source Monitoring Guidance" (TMDL GM No. 09-2001; DEQ 2009) was a review of available literature. The premise is that different types of industrial activity at applicable permitted facilities have a greater correlation with historic PCB use, and thus, are susceptible to residual on-site contamination which could be carried off-site via effluent and/or stormwater. This information was summarized and associations were built between prospective PCB sources and specific SIC Group Codes (Table 1). Municipal WWTPs, placed into Major SIC Code group 4900, were also included based on evidence suggesting an association with "pass-through" PCB loading (i.e., the origin of PCBs is off-site within the municipal system). The results included in the present analysis have shown that the guidance has served as a critical tool in assisting DEQ in performing TMDL source investigation studies. The guidance has led to identifying prospective sources that will need to reduce previously unknown PCB loads through an adaptive implementation approach. While the "PCB Point Source Monitoring Guidance" (TMDL GM No. 09-2001; DEQ 2009) provided a guideline for including facilities, it was never considered to provide an absolute or comprehensive listing of potential source categories for PCBs. The results of this study support that fact as 11 additional Major SIC Code Groups (Table 2) may contain industries that are prospective PCB sources to impaired waters. In light of these results, there is now strong evidence showing the need to screen several of the newly identified industries/facilities (Attachment 1) that fall within the realm of some recently identified Major SIC Group Codes.

An important conclusion drawn from this data assessment is that tPCB monitoring in Virginia, when performed using a robust analytical methodology, yields a more complete characterization of prospective sources. Identifying these previously unknown releases of PCBs are a concern relative to their bioaccumulation within fish. With the use of best professional judgment, the evidence supports the need to expand the list of industries contained within the indentified Major SIC Group Codes that are considered prospective sources under the "PCB Point Source Monitoring Guidance" (TMDL GM No. 09-2001; DEQ 2009).

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Attachment 1

Total PCB (pg/L) concentrations collected beginning in 2009 through 2014 from VPDES permitted effluents representing different Industries (SICs) within Major SIC Code Groups. Tabulated data are uncensored as defined by TMDL GM No. 14-2004. Note: Inclusion within this table does not automatically infer applicable facilities should be screened for PCBs.

Major SIC Code Group	SIC description	SIC	* Sample Size (n)	Mean tPCB Conc (pg/L)	Median tPCB Conc. (pg/L)
2000	Dry, Condensed, and Evaporated Dairy Products	2023	1	435.0	-
	Prepared Fresh or Frozen Fish and Seafoods	2092	1	23,754.0	-
2100	Tobacco Stemming and Redrying	2141	3	1,177.7	157.9
2200	Broadwoven Fabric Mills, Manmade Fiber and Silk	2221	3	820,760.1	856,604.1
	Finishers of Broadwoven Fabrics of Manmade Fiber and Silk	2262	2	4,852.4	4,852.4
2600	Paperboard Mills	2631	7	3,538.9	1,532.9
	Corrugated and Solid Fiber Boxes	2653	3	1,615.0	1,495.6
	Plastics, Foil, and Coated Paper Bags	2673	2	60.9	60.9
2700	Book Printing	2732	1	3,882.0	-
	Commercial Printing, Gravure	2754	3	2,121.6	1,135.5
2800	Plastics Materials, Synthetic Resins, and Nonvulcanizable Elastomers	2821	14	6,583.2	1,066.4
	Cellulosic Manmade Fibers	2823	1	219,157.6	-
	Manmade Organic Fibers, Except Cellulosic	2824	3	12,154.6	8,646.6
	Industrial Organic Chemicals, Not Elswhere Classified	2869	7	710.8	478.1
	Explosives	2892	7	4,514.2	5,427.3
3000	Tires and Inner Tubes	3011	1	1,740.4	-
	Unsupported Plastics Film and Sheet	3081	2	34.3	34.3
	Plastic Bottles	3085	1	331.0	-
3200	Lime	3274	1	915.0	-
3300	Steel Works, Blast Furnaces (Including Coke Ovens), and Rolling Mills	3312	7	108,026.0	18,949.0
	Gray and Ductile Iron Foundries	3321	9	828.5	14,670.6
3400	Fabricated Structural Metal	3441	11	2,255.4	3,469.9
	Fabricated Plate Work (Boiler Shops)	3443	4	8,990.2	3,378.1
	Sheet Metal Work	3444	2	11,871.9	11,871.9
	Automotive Stampings	3465	1	675.0	-
	Electroplating, Plating, Polishing, Anodizing, and Coloring	3471	2	5,349.2	5,349.2
	Coating, Engraving, and Allied Services, Not Elsewhere Classified	3479	7	4,698.9	1,416.4
	Valves and Pipe Fittings, not elsewhere classified	3494	2	18,374.5	18,374.5
	Fabricated Metal Products, Not Elsewhere Classified	3499	1	611.0	-
3600	Power, Distribution, and Specialty Transformers	3612	7	65,118.1	47,346.5
3700	Motor Vehicles and Passenger Car Bodies	3711	4	250.6	120.6
	Truck and Bus Bodies	3713	3	1,010.5	1,125.7
	Motor Vehicle Parts and Accessories	3714	6	7,291.9	3,894.5
	Aircraft Engines and Engine Parts	3724	1	5,833.0	-
	Ship Building and Repairing	3731	7	8,655.8	5,394.1
	Railroad Equipment	3743	5	10,678.3	8,780.6
4000	Railroads, Line-Haul Operating	4011	3	4,250.1	3,063.5
4200	Local Trucking without Storage	4212	2	17,923.0	17,923.0
	Trucking, Except Local	4213	1	21,596.0	-
	General Warehousing and Storage	4225	4	8,072.0	2,402.8
	Special Warehousing and Storage, Not Elsewhere Classified	4226	2	2,238.8	2,238.8
4400	Marine Cargo Handling	4491	4	103,570.6	7,258.9
	Water Transportation Services, not elswhere classified	4499	2	10,633.2	10,633.2
4700	Fixed Facilities and Inspection and Weighing Services for Motor Vehicle Transportation	4785	6	86,397.9	18,711.9
4900	Electric Services (facilty constructed pre-1985)	4911	17	51,011.0	2,461.4
	Electric Services (facilty constructed post-1985)	4911	18	286.6	125.4
	Natural Gas Transmission	4922	1	1,545.0	-
	Sewerage Systems	4952	84	1,707.1	1,030.8
	Refuse Systems	4953	21	31,418.2	1,738.6
	Steam and Air-Conditioning Supply	4961	1	1,882.0	-
5000	Motor Vehicle Parts, Used	5015	7	16,825.9	1,169.7
	Scrap and Waste Materials	5093	21	858,705.4	150,186.7
5100	Petroleum Bulk Stations and Terminals	5171	6	1,203.2	822.1
7600	Repair Shops and Related Services, not elsewhere classified	7699	1	6,556.0	-
9700	National Security	9711	6	11,922.4	8,326.0

* Sample size can include multiple facilities and/or multiple outfalls from a given facility

**** Boldfaced = New SIC Group beyond scope of TMDL GM NO. 09-2001 but to be considered for future monitoring.**